REMARKS

By the present Amendment, claims 1 and 10 have been amended. No claims have been added or cancelled. Accordingly, claims 1-10remain pending for examination. Claims 1 and 10 are independent.

In the Office Action of May 21, 2010, claims 1-3, 5 and 10 were rejected under 35 USC §102(e) as being anticipated by U.S. Patent No. 7,274,363 issued to Ishizuka et al. ("Ishizuka"). Claim 4 was rejected under 35 USC §103(a) as being unpatentable over Ishizuka in view of U.S. Patent Application No. 2002/0030647 to Hack et al. ("Hack). Claims 6 and 7 were rejected under 35 USC §103(a) as being unpatentable over Ishizuka in view of U.S. Patent No. 6,518,962 issued to Kimura et al. ("Kimura"). Claims 8 and 9 were rejected under 35 USC §103(a) as being unpatentable over Ishizuka in view of U.S. Patent No. 6,414,443 issued to Tsuruoka et al. ("Tsuruoka"). These rejections are respectfully traversed.

Claims 1-3, 5, and 10 were rejected under 35 USC §102(e) as being anticipated by Ishizuka. Regarding this rejection, the Office Action alleges that Ishizuka discloses a display apparatus that includes a pixel array including a plurality of pixels that each includes a light emitting unit, a drive element, and a switching element. The display apparatus is further indicated as disclosing a data signal drive circuit for receiving the image data for each frame period and outputting the image signal to the pixel array, a scanning signal drive circuit for outputting a scanning signal to the pixel array, and a current source for outputting the current supplied to the light emitting unit. Additionally, the Office Action indicates that the current source modulates the value or the amount of current being output. Applicants respectfully disagree.

Independent claim 1 defines a display apparatus that comprises:

> a pixel array including a plurality of pixels, each pixel including:
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> a light emitting unit,
>
> a drive element for controlling supply of a current to said light emitting unit, and
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> a switching element for controlling said drive element according to an image signal;
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> a data signal drive circuit for receiving image data for each frame period and outputting said image signal to said pixel array based on said image data, said each frame period being provided for displaying one screen of said image data;
>
> a scanning signal drive circuit for outputting a scanning signal to said pixel array, said scanning signal being for controlling a timing at which said switching element receives said image signal; and
>
> a current source for, through said drive element, outputting said current supplied to said light emitting unit;
>
> wherein said current source applies a voltage control by modulating the value or the amount of said current according to a change in light emission state of the number of pixels within said each frame period, said current being output from said current source.

The display apparatus of independent claim 1 includes a pixel array, a data signal drive circuit, a scanning signal drive circuit, and a current source. The pixel array includes a plurality of pixels that each includes a light emitting unit, a drive element for controlling the current supplied to the light emitting unit, and a switching element to control the drive element according to an image signal. The data signal drive circuit receives image data for each frame period and outputs the image signal to the pixel array based on the image data, with each frame period being provided for displaying one screen of the image data. The scanning signal drive circuit outputs a scanning signal to the pixel array for controlling the timing at which the switching element receives the image signal. The current source outputs the current supplied to the light emitting unit through the drive element. According to independent claim 1, the current source applies a voltage control by modulating the

value, or the amount, of current according to a change in the light emission state of the pixels within each frame period and also outputs the current being supplied.

As discussed in the Specification, pulse width modulation is applied to an input signal for each pixel in order to achieve, for example, a gray scale display. The display synchronous cathode potential control circuit can reduce the cathode side potential of the organic EL elements, thereby increasing the voltage between both electrodes according to the display phase signal. This allows only those pixels with high grayscale values to emit light at high luminance levels, thereby enhancing the peak luminance and visual impact of the display screen. See paragraphs [0085] and [0086] of the Published Application.

The Office Action alleges that Ishizuka discloses all of the features recited in independent claim 1. This does not appear to be the case. Ishizuka discloses a display panel driving device wherein the value of the light emission drive current flowing to each pixel element emits light in succession is measured. The luminance is subsequently corrected for each input pixel data based on the light-emission drive current values. According to Ishizuka, current from the power supply circuit is supplied via a switch when the switch is turned on or via resistor when the switch is turned off. See column 18, lines 34 to 45. A controller is used to control the on-off state of the switch, and the current measuring circuit outputs a voltage that corresponds to the value of the current flowing through the resistor. The controller further executes a leak current canceling routine that measures the current flowing in the display panel when the light-emission drive is ceased in all of the pixel positions. The timing for executing these routines is provided when the power supply of the display apparatus is turned off, when the image data is not being input, or during intervals between one subfield and the next subfield.

According to various features of the present invention, the display synchronous cathode potential control circuit 27 reduces the cathode side potential of the organic EL elements 24 and thereby increases the voltage between both electrodes of each organic EL element 24 according to the display phase signal 63 only while the pixels with small gray scale numbers are emitting no .light and the pixels with large gray scale numbers are emitting light. See paragraph [0095]. More particularly, the period during which the pixels with small gray scale numbers (dark) are emitting no light and the pixels with large gray scale numbers (light) are emitting light increases the required voltage of the EL elements in the period where the number EL elements emitting light is low. Conversely, display synchronous cathode potential circuit 27 does not apply any high voltage to the organic EL elements 24 while the pixels with low gray scale values are emitting light. In other words, the period of the pixels with small gray scale numbers are emitting light does not increase the required voltage of EL elements in the period where the number of EL elements emitting light is high, thereby increasing peak luminance and contrast.

For example, if 64 gray scale levels (0-63) are to be displayed, all pixels other than the pixel whose light emission time period is 0 (that is, whose gray scale number is 0) begin to emit light at time T0. As time elapses, the pixels sequentially stop emitting light in the order of increasing gray scale number. Specifically, the pixel whose gray scale number is 63 becomes the last to stop emitting light. Alternatively, it is possible to control the pixels such that all pixels stop emitting light at time T0, and then sequentially begin to emit light in the order of decreasing gray scale number. See paragraph [0093]. As illustrated below, the times at which pixels emit light during 1 frame period wherein 8 gray scale levels are utilized differs from that of Ishizuka:

	Ishizuka	Present Invention
gray scale level = 0	xxxxxxx	xxxxxxx
gray scale level = 1	0xxxxxx	0xxxxxx
gray scale level = 2	x00xxxx	00xxxxx
gray scale level = 3	000xxxx	000xxxx
gray scale level = 4	xxx0000	0000xxx
gray scale level = 5	0xx0000	00000xx
gray scale level = 6	x000000	000000x
gray scale level = 7	0000000	0000000

where 0 = light emission
x = no light emission

Clearly, the apparatus of independent claim 1 differs from that of Ishizuka. It is therefore respectfully submitted that independent claim 1 is allowable over the art of record.

Claims 1 to 9 depend from independent claim 1, and are therefore believed allowable for at least the reasons set forth above with respect to independent claim 1. In addition, these claims each introduce novel elements that independently render them patentable over the art of record.

Independent claim 10 defines a method for displaying an image based on image data by using a pixel array that includes a plurality of pixels. Each of the pixels includes a light emitting unit, a drive element for controlling the supply of current to the light emitting unit, and a switching element for controlling the drive element according to an image signal. The method comprises the steps of:

> outputting said current from a current source to said light emitting unit through said drive element;
>
> receiving said image data for each frame period and outputting said image signal from a data signal drive circuit to said pixel array based on said image data, said each frame period being provided for displaying one screen of said image data;

outputting a scanning signal from a scanning signal drive circuit to said pixel array, said scanning signal being for controlling a timing at which said switching element receives said image signal; and

applying a voltage control by modulating the value or the amount of said current according to a change in light emission state of the number of pixels within said each frame period, said current being output from said current source.

The method of independent claim 10 recites various steps that correspond somewhat to the features recited an independent claim 1. In particular, the method of independent claim 10 requires application of a voltage control by modulating the value or amount of current accordance to a change in light emission state of the number of pixels within each frame period, with the current being output from the current source. As previously discussed, such features are not shown or suggested by the art of record.

It is therefore respectfully submitted that independent claim 10 is allowable over the art of record.

For the reasons stated above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, the issuance of a Notice of Allowance is believed in order, and courteously solicited.

If the Examiner believes that there are any matters which can be resolved by way of either a personal or telephone interview, the Examiner is invited to contact Applicants' undersigned attorney at the number indicated below.

AUTHORIZATION

Applicants request any shortage or excess in fees in connection with the filing of this paper, including extension of time fees, and for which no other form of payment is offered, be charged or credited to Deposit Account No. 01-2135 (Case: 501.43143X00).

Respectfully submitted,
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